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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,466	03/20/2001	Bruno C. Silva	MICR0195	3599
27792	7590	08/09/2005	EXAMINER	
MICROSOFT CORPORATION LAW OFFICES OF RONALD M. ANDERSON 600 108TH AVENUE N.E., SUITE 507 BELLEVUE, WA 98004			GOOD JOHNSON, MOTILEWA	
			ART UNIT	PAPER NUMBER
			2677	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/813,466

**Applicant(s)**

SILVA, BRUNO C.

**Examiner**

Motilewa A. Good-Johnson

**Art Unit**

2677

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-36 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Laferriere, U.S. Patent Number 6,226,005, "Method and System for Determining and/or Using Illumination Maps in Rendering Images", in view of Chen, U.S. Patent Number 5,613,048, "Three-Dimensional Image Synthesis using View Interpolation", 03/18/1997.

Regarding claim 1, Laferriere discloses a method for simulating a real-time rendering of a desired graphical effect in an image constituting a portion of a displayed scene on a object on a display, in regard to a single static viewpoint, (col. 5, lines 1-17, camera point of view) comprising the steps of: precomputing data defining a behavior of light rays illuminating the object (col. 3, lines 5-9, producing illumination map for at least one object in a scene, and col. 4, lines 52-59, determining, i.e. precomputing, each light source, i.e. light rays, in a scene or evaluation of all active components) in regard to the single static viewpoint based on a plurality of input images, (col. 5, lines 8-17, illumination map independent of camera point and view, and therefore a single static

viewpoint may be employed) to produce a plurality of maps for the object (col. 4, line 66 –6 col. 5, line 7, producing illumination maps) in which at least one set of pixel-dependent data is associated with each pixel position on the display; (col. 7, lines 24-35) b) in response to one of a user action and an event that indicates the desired graphical effect in the image of the object (col. 5, lines 35-36, the user selects one or more texture maps for a desired illumination value and furthermore in col. 5, lines 20-22, once an illumination map is determined the objects can be changed and rendered)

However, it is noted that Laferriere fails to disclose morph maps to perform transformations using the morph maps to produce an output image.

Chen discloses in the morphing process determining a correspondence or mapping of the points in the image and completing the blending in the morph process, col. 4, lines 1-30, and displaying the image, col. 3, lines 35-38.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include with the illumination maps created by Laferriere, the morph maps stored for the images as disclosed in Chen, to reduce real-time processing requirements to describe the correspondence of an entire morph scene.

Regarding claim 2, Laferriere discloses precomputing comprises the step of producing data that include a blend factor (col. 8, line 40)

Regarding claim 3, Laferriere discloses precomputing comprises the step of producing data that include an additive factor that is used to control saturation of the output image. (col. 8, lines 44-20, diffuse color factor used to adjust the intensity, i.e. saturation)

Regarding claim 4, Laferriere discloses precomputing comprises the step of tracing rays of light to determine the plurality of morph maps based on a global illumination and a local illumination at each intersection of the rays of light with a surface. (col. 6, lines 6-7, 30-69 and col. 8, line 65 – col. 9, line 13)

Regarding claim 5, it is noted that Laferriere fails to disclose a) producing a plurality of warped images from the plurality of morph maps; and b) combining the plurality of warped images over a range, with a cross-dissolve, to produce successive output images in which the object morphs between an initial state and a final state.

Chen discloses computing deformed, i.e. warped, images and cross-dissolving the images between a destination image and a source image to produce the final image, col. 5, lines 1-14.

It would have been obvious to one of ordinary skill in art at the time of the invention to include in the illumination maps and the interpolation of the illumination map disclosed in Laferriere, warping image and cross-dissolving to produce the final image, as disclosed in Chen, to provide smoother interpolation.

Regarding claim 6, Laferriere discloses performing the transformation comprises the step of mapping a selected portion of a surface of the object onto a different part of the object to simulate an effect corresponding to movement of the selected portion of the surface over the object. (col. 2, lines 8-64)

Regarding claim 7, Laferriere fails to disclose only pixels of the object that have been altered during the transformation to implement the effect are recomputed in the output image per se, however, Laferriere discloses points of interest are rendered and

updated in the appropriate data structure, therefore making it inherent that the data structure would update, i.e. recomputed, the altered points of interest, i.e. transformed image area in the final image, (col. 9, lines 3-30)

Regarding claim 8, a) providing a grid of cells that overlies and bounds pixels in the selected portion of the surface of the object in the output image; (col. 2, lines 10-12) b) for each cell of the grid, associating an arbitrary rectangle having an area that bounds all samples in an original image affected by the pixels in the cell of the output image; (col. 6, lines 13-22) and c) determining a union of all rectangles that are associated with the cells of the grid that intersect the area of the arbitrary rectangle, to produce the output image (col. 6, lines 30-39)

Regarding claim 9, Laferriere fails to disclose using an index to map between a region in an input image and a corresponding region in the output image, to determine which portion of one of the input image and the output image is changed if a portion of the other of the input image and the output image has changed

Chen discloses an inverse mapping defined for each pixel in the target image to the location of the source image for which correspondences can be mapped, col. 9, line 53 – col. 10, line 22.

It would have been obvious to one of ordinary skill in art at the time of the invention to include in the illumination maps and the interpolation of the illumination map disclosed in Laferriere, indexing of the source and destination image to determine changes in the image, as disclosed in Chen, to prevent holes that may arise in image mappings.

Regarding claim 10, a) mapping a texture onto the object in the output image; (col. 3, lines 5-10) b) applying a reflection to the object in the output image; (col. 2, lines 18-24) c) applying a refraction of the object in the output image (col. 2, lines 18-24)

Regarding claim 11, precomputing includes the step of storing anti-aliasing data for use in producing the output image (col. 14, lines 1-4)

Regarding claim 12, precomputing is based on one of a three-dimensional geometry of the input images and a set of properties of a material in the input images. (col. 7, lines 28-45)

Regarding claim 13, data produced in the step of precomputing includes a lookup table in which parameters used in producing the output image are stored. (col. 11, lines 1-6)

Regarding claims 14-16, they are rejected based upon similar rational as above claim 1.

Regarding claim 17, Laferriere discloses a) anti-aliasing to smooth edges in the output image; (col. 11, lines 1-10) b) displaying light refraction . . . ; c) displaying light reflection . . . ; (col. 2, lines 19-25)

However, it is noted that Laferriere fails to disclose d) morphing between an object in the displayed scene and a substantially altered object . . . ; and e) dynamically warping a selected portion . . .

Chen discloses computing deformed, i.e. warped, images and cross-dissolving the images between a destination image and a source image to produce the final image in the morphing process, col. 5, lines 1-14.

It would have been obvious to one of ordinary skill in art at the time of the invention to include in the illumination maps and the interpolation of the illumination map disclosed in Laferriere, warping image and cross-dissolving to produce the final image, as disclosed in Chen, to provide smoother interpolation and prevent holes that map arise in mapping.

Regarding claim 18, a) an index that identifies a pixel data set from among a plurality . . . ; (col. 7, lines 33-35, a pointer to a linked list, which Examiner interprets as an index) b) an image identifier . . . that indicates one of: i) the input image . . . ; (col. 7, lines 24-27) and ii) a constant color . . . ; (col. 7, lines 28-33) c) coordinates of the pixel in the input image; (col. 7, lines 36-40) d) the constant color that is to be applied to the pixel . . . ; (col. 8, lines 61-63) f) an additive factor used to shift the appearance . . . ; (col. 8, lines 63-65) and g) a blending factor . . . (col. 8, lines 40-43)

Regarding claim 19, precomputing comprises the step of computing the plurality of morph maps with a light-simulating algorithm . . . (col. 5, lines 1-7)

Regarding claim 20, rendering of a textured patch on a surface of an object as the patch is dragged over the surface . . . (col. 6, lines 1-21)

Regarding claim 21, rendering of an object simulating a refraction that occurs as light reflected from the object passes through a non-homogeneous medium . . . (col. 2, lines 18-25)

Regarding claim 22, only pixels in the input image that have changed are transformed to produce the output image. (col. 6, lines 13-46)



Regarding claim 23, Laferriere fails to disclose bi-directionally mapping between each of a plurality of pixels in a selected region of the input image and a corresponding pixel in a corresponding region of the output image . . .

Chen discloses three dimensional image synthesis and a morphing technique, (abstract) and further discloses the morphing method using a shadow map for each light source from the viewpoint to each point on the image, col. 9, lines 10-40). Chen discloses maps are computed and stored and bi-directional maps stored for each image, col. 4, lines 50-55.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the illumination maps disclosed in Laferriere, bi-directional maps, as disclosed in Chen, to further reduce real-time processing requirements for each of the images rendered.

Regarding claims 24-36, they are rejected based upon similar rational as above claims 1-15 respectively.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1-36 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that Laferriere fails to contemplate the use of morph maps in adapting an image and also fails to disclose a graphical effect resulting in the simulation of real-time rendering of an output image to the user action. Laferriere discloses and illumination map representing the illumination information at points of interest in a scene

to be rendered and the illumination map can be used by the rendering engine to obtain the final rendered image, col. 4, line 66 – col. 5, lines 7. It is the position of the Examiner that the illumination map is itself not rendered, but used in the final rendered scene and therefore creates a simulation of illumination information in an image and therefore simulation a rendered graphical effect of an image.

Applicant argues that Laferriere fails to disclose a graphical effect resulting in the simulation of rendering in response to a user action. Laferriere discloses col. 5, lines 35-36, the user selects one or more texture maps for a desired illumination value and furthermore in col. 5, lines 20-22, once an illumination map is determined the objects can be changed and rendered. Laferriere further discloses the illumination maps are independent of the texture pictures and once an illumination map is determined the objects can be changed and rendered with the need to determine a new illumination map, col. 5, lines 18-23.

Application argues that Laferriere and Chen fail to disclose the advantage of not having to re-render an image. Laferriere discloses producing and using an illumination map for at least one object in a scene to be rendered. Laferriere further discloses that the object uses the illumination information from the illumination map to be used in rendering a scene at a determined location of each object in the scene, cols. 3 – 4. It is therefore the interpretation of the Examiner that each object in the scene is not rendered, but however simulated using an illumination map and the entire scene is rendered with the illumination map information provided.

***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Motilewa A. Good-Johnson whose telephone number is (571) 272-7658. The examiner can normally be reached on Monday, Tuesday and Thursday 9:00 AM - 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Motilewa A. Good-Johnson  
Examiner  
Art Unit 2677

mgj



**BIPIN SHALWALA**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2600**